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PATENT
Atty Docket No. KLAC0075

I HEREBY CERTIFY THAT ON MARCH 4, 2008, THIS CORRESPONDENCE IS BEING DEPOSITED WITH THE UNITED STATES POSTAL SERVICE AS FIRST CLASS MAIL IN AN ENVELOPE ADDRESSED TO: MAIL STOP APPEAL BRIEF - PATENT, COMMISSIONER FOR PATENTS, P.O. BOX 1450, ALEXANDRIA, VA 22313-1450.

STEVEN W. SMYRSKI

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	Group Art Unit: 2872
YUNG-HO CHUANG, ET AL.	Examiner: Lee A. Fineman
Title: INSPECTION SYSTEM USING SMALL CATADIOPTRIC OBJECTIVE	
Serial No.: 10/615,512	
Filed: July 7, 2003	

REPLY BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This is in reply to the Examiner's Answer mailed January 4, 2008 in the above-referenced application and associated appeal.

REMARKS

Anticipation – Chuang

The current Appeal raises the issue of what in FIG. 17 of Chuang constitutes an "imaging subsystem" as the term is employed in the claims. The Examiner takes a narrow view of the "imaging subsystem" as only comprising focusing group 1702, an attempt to satisfy the "less than approximately 100 millimeter" requirement in all pending independent claims. Appellants take the position that the imaging sub system recited in the independent claims is broader and includes catadioptric group 1701, including Mangin mirror element 1706, an element having diameter greater than approximately 100 millimeters, needed to produce the claimed design aspects claimed in claim 1 and all pending independent claims.

Appellants focus on the claim language itself, which requires that the imaging system is "oriented and configured to receive said light energy from said illumination system and direct light energy toward said specimen, said imaging subsystem comprising a plurality of elements all aligned along a single axis, each element having diameter less than approximately 100 millimeters, *wherein the imaging subsystem is configured to provide a field size in excess of approximately 0.4 millimeters at a numerical aperture of approximately 0.90* for the light energy received from the illumination system having the wavelength in the range of less than approximately 320 nanometers" (Claim 1, with similar limitations in claims 75, 83, and 86).

Appellants submit that the limitations of being "configured to provide a field size in excess of approximately 0.4 millimeters" "at a numerical aperture of approximately 0.90" cannot be satisfied by Chuang's focusing group 1702 alone, but needs catadioptric group 1701 to actually achieve these limitations. Light emitted from lens 1708 and thus from focusing group 1702 does not provide a field size in excess of approximately 0.4 millimeters at a numerical aperture of approximately 0.90 – the catadioptric group 1701 is required to provide this functionality.

Further, as previously noted, the "imaging subsystem" is required to be "oriented and configured to receive said light energy from said illumination system and *direct light energy toward said specimen,*" not direct light energy toward a catadioptric group or other intermediate elements. This further demonstrates that the Chuang catadioptric group alone does not satisfy the limitations related to the "imaging subsystem" language.

The Examiner's Answer states "the focusing group of Chuang (1702, fig. 17) is clearly an imaging subsystem (focuses the light to form an image at 1707, see fig. 17) and includes a plurality of lenses (1708-1716) and directs light toward said specimen ([1704], see fig 17. These lenses alone meet all the requirements of the imaging subsystem as claimed." (Examiner's Answer, pp. 7-8). Appellants submit that while the focusing group 1702 of FIG. 17 of Chuang and the lenses shown therein do perform "imaging," the focusing group 1702 is not "configured to provide a field size in excess of approximately 0.4 millimeters at a numerical aperture of approximately 0.90" as required by the language of independent claims 1, 75, 83, and 86.

Appellants particularly point to the "prescription" at Col. 20, ll. 17-44 of Chuang include surfaces/elements 1705 and 1706 as part of the system said to provide a field size of 4.0 mm for a 0.97 NA. "This embodiment of the system is an all fused silica design with a 0.97 NA, 4.0 mm field size...Dimensions of the system of FIG. 17 are as follows [including recitation of elements 1705 and 1706 as surfaces 20-25]." Chuang, Col. 20, ll. 6-44. Thus all elements, including elements 1705 and 1706, are required by the Chuang system to provide the recited field size and NA, and the elements included that enable these values include mangin element 1705 and reflector 1706, where reflector 1706 has diameter in excess of 100 millimeters. Thus in order to deliver a 0.97 NA and 4.0 mm field size, the Chuang design must include reflector 1706, an element having diameter in excess of 100 millimeters.

The Examiner cannot have it both ways. It cannot be said that the focusing group of Chuang is the "imaging subsystem" of the independent claims to avoid the 100 millimeter diameter limitation, but then also say that a design having a 4.0 mm field size

and 0.97 NA that requires mangin element 1705 and reflector 1706 anticipates the invention. Chuang does not show an imaging subsystem "comprising a plurality of elements all aligned along a single axis, each element having diameter less than approximately 100 millimeters, wherein the imaging subsystem is configured to provide a field size in excess of approximately 0.4 millimeters at a numerical aperture of approximately 0.90..." Using either all the elements shown in Chuang FIG. 17 does not satisfy the claim language (each element does not have diameter less than approximately 100 millimeters), and using only the lenses in focusing group 1702 also fails to satisfy the claim language (the focusing group 1702 is not configured to provide a field size in excess of approximately 0.4 millimeters at a numerical aperture of approximately 0.90).

The standard of anticipation is identity of invention. In other words, the reference must disclose the claimed invention in as much detail as is recited in the claim. See MPEP 2131; *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989) ("The identical invention must be shown in as complete detail as is contained in the ... claim."); see also, *In re Kotzab*, 217 F.3d 1365, 1371, 55 U.S.P.Q.2d 1313, 1318 (Fed. Cir. 2000). The elements must be arranged as required by the claim. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990). Here, identity of invention is not satisfied; the cited reference is either missing a design that has an approximately 100 millimeter diameter or that is configured to provide a field size in excess of approximately 0.4 millimeters at a numerical aperture of approximately 0.90, and thus all independent claims are not anticipated. Claims depending from independent claims 1, 75, 83 and 86 are also not anticipated as they include limitations not found in the cited reference.

Accordingly, it is respectfully submitted that all pending claims fully comply with 35 U.S.C. § 102.

Obviousness – Chuang in view of Shafer/Liang in view of Shafer '722

Chuang + Shafer

With respect to Chuang in combination with Shafer, used in rejecting claim 1, as noted above, Chuang does not include a design wherein the salient elements are each less than 100 millimeters in diameter as required by the express language of claim 1 ("said imaging subsystem comprising a plurality of elements all aligned along a single axis, each element having diameter less than approximately 100 millimeters", as well as the requirement that the design "wherein the imaging subsystem is configured to provide a field size in excess of approximately 0.4 millimeters at a numerical aperture of approximately 0.90"). The FIG. 17 embodiment of Chuang shows a catadioptric element 1706 that exceeds the 100 millimeter diameter value that is needed to provide a field size of 4.0 mm and a NA of 0.97. The fact that catadioptric or dome shaped reflector 1706 has a diameter in excess of 100 millimeters and is necessary to provide a field size of 4.0 mm and a NA of 0.97 indicates claim 1 is not obvious based on Chuang in view of Shafer.

Liang + Shafer

Appellants submit that Liang does not disclose nor suggest a design having "a field size in excess of approximately 0.4" (claim 75), or similar language. The Examiner's Answer mischaracterizes the Liang argument, stating "The appellant additionally argues that the Liang reference provides no support for its disclosed/claimed field of range of 'substantially 220-240 μm or more" *actually being more than 240 μm...*" (Examiner's Answer, p. 9, emphasis added). Appellants are not arguing this – as noted by Appellants, Liang does use the phrase "or more" - the argument presented is one of degree – how much "more" is disclosed? Three inches? Ten feet? A thousand yards? To answer the question of degree, Appellants look to the actual disclosure of Liang, which presents certain acceptable OD/FOA ranges, and 0.4 millimeters is significantly outside the ranges disclosed. Thus Appellants are not arguing that Liang does not disclose "or more" – Appellants are arguing that Liang does not stand for, suggest nor disclose a field of view 66% greater than the value actually disclosed.

Shafer '722 is a materially different design, an off-axis device that does not conform to the present claims due to the limitation of alignment along a single axis (e.g. claim 75, "comprising a plurality of optical elements all aligned along an axis"; claim 1, "said imaging subsystem comprising a plurality of elements all aligned along a single axis"). A fundamental argument being made is that one can simply employ certain elements with previously available but materially different objective designs and obtain a functional design having the beneficial aspects claimed. In reality, certain design elements cannot be wholesale incorporated into existing designs and produce a workable completed design, such as an off-axis objective being fundamentally changed to an on-axis objective that produces improved performance characteristics. Appellants submit that as a result, the off-axis Shafer '722 design could not be combined with the teachings of Liang to produce a workable design, much less one that conforms to the limitations of the present claims.

Shafer '722 therefore represents a fundamentally different design from Liang and from that presented in the present specification and claimed, and one cannot simply take concepts, ideas, or components form one design and use them freely within another design to produce a claimed combination if that design would not be functional without excessive experimentation or radical changes in design. Appellants therefore dispute the combination of Liang with Shafer '722 on this basis.

Regarding the "field size in excess of 0.4 millimeters," the Office Action points to MPEP 2131.03 regarding claiming ranges. Appellants note that this passage expressly states :

> [i]n order to anticipate the claims, claimed subject matter must be disclosed in the reference with 'sufficient specificity to constitute an anticipation under the statute.' What constitutes a 'sufficient specificity' is fact dependent.

As outlined in detail in the Appeal Brief, the simple recitation of "220 to 240 μm or more" in Liang is not factually sufficient to anticipate a claim or claims of 0.4

millimeters, but in reality represents a significantly smaller value based on a clear reading of Liang. No design showing a FOV greater than the "substantially 220-240 μm or more" is disclosed or even suggested in Liang, but the maximum FOV appears to be in the cited 220-240 μm range or possibly slightly higher based on use in Liang of the word "around." However, the field of view cannot be said to be 66 per cent higher than the 220-240 μm wording and related FOV-to-OD language present in the actual disclosure of Liang. A FOV of 0.400 mm, recited in all pending claims of the present application, using a Liang OD of greater than 1.6 mm yields a FOV-to-OD ratio of over 0.25, a full 66% increase over the .15 value actually called out as the highest FOV-to-OD numeric value in Liang. Thus in looking at the facts and the "specificity" of the claims and disclosure of Liang, as required by MPEP 2131.03, it cannot be said that Liang discloses with "sufficient specificity" a 0.4 millimeter design, a full 66 per cent higher value than the 240 micrometer FOV described in or supported by the Liang disclosure.

The Examiner's Answer argues with this, relying on Equation 0.4 of Liang. Appellants respectfully submit that the Examiner is misinterpreting the teachings of Liang. The Examiner states that equation 0.4 of Liang provides that the upper limit of magnification is equal to 1.06875 * OD/Full FOV, which is correct for the upper limit of magnification. What the Examiner is proposing is that both the upper limit and lower limit of magnification for the design is set at 4.0 when the NA is 0.9. Liang goes into detail describing certain alternative embodiments, including variations in NA, and states that 4.0 can be a lower limit of the design. However, a design that solely employs an upper magnification limit and lower magnification limit both having values of 4.0 is impractical and unusable and is not a functional or usable design. FIG. 1 of Liang shows that magnifications are to vary over a range, and an upper limit of 12 is shown for both regions A and B in FIG. 1. Appellants submit that the statement in paragraph [0048] of Liang should have more clearly stated:

> According to shaded region A, the magnification M is preferably between just above one and around M=11 or 12, while according to the particularly preferred shaded region B, the

magnification M is [[greater than M=4]] preferably between just above four and around M=11 or 12.

This interpretation is bolstered by the statement in Liang at paragraph [0047] that "a range of absolute values or magnitudes of transverse magnifications from around just above one (or preferably greater than 4) to around 11" (emphasis added) Again, an objective having a lower limit of magnification of 4.0 and an upper limit of magnification of 4.0 is impractical and unusable, and Liang does not contemplate nor suggest such an unusable design. Such a construction is only created by rank speculation and an improper reading of the reference.

A realistic value of m_{obj} (upper limit) is around 12, which yields a Full FOV according to equation 0.4 of Liang of 0.178125 millimeters. This is in accordance with the range of FOV values actually disclosed in the reference and significantly less than the 0.4 millimeter field of view claimed.

Appellants again stress the actual embodiments, rather than theoretical constructs forwarded in the Examiner's Answer, relating FOV and OD of the Liang design. The actual Liang design, a miniature microscope array of objectives, discloses a FOV-to-OD ratio between "about" 0.09 to "around" 0.15. No FOV-to-OD ratio larger than 0.15 is expressly called out in Liang, and no ODs (outside diameters) smaller than 1.6 mm are suggested. No such design having an FOV to OD ratio greater than "around" 0.15 is anywhere described in Liang. Further, no design showing a FOV greater than the "substantially 220-240 μm or more" is shown in Liang, but the maximum FOV appears to be in the cited range or possibly slightly higher based on use of the word "around." However, the field of view cannot be said to be 66 per cent higher based on the actual design disclosed in Liang. These are the actual designs disclosed by Liang.

A patent is only a reference for what it discloses, not some hypothetical prediction or assertion, or some equation that can be twisted to reflect a theoretical unusable embodiment.

As with a design having a 20 meter or infinite FOV that could be misread to fall within the "substantially 220-240 μm or more" wording of Liang, in reality the Liang

specification does not support a realistic FOV significantly larger than the 0.240 millimeters disclosed, at a numerical aperture of approximately 0.90. Thus Appellants submit that Liang does not disclose nor suggest a design having "a field size in excess of approximately 0.4" (claim 75), or similar language.

Combination of References

Chuang + Shafer

Appellants continue to dispute the reasoning employed in combining the Chuang and Shafer references. The combination alleged is the Chuang objective, such as that shown in FIG. 17, with an arc lamp similar to that discussed in Shafer. As noted above, Chuang is missing the 100 millimeter limitation and the performance specified in Claim 1, as is Shafer, and thus any combination cannot be said to show the claimed invention, as a material limitation is missing even in the presence of such a combination. Second, simply plugging in an arc lamp into the Chuang design may not produce the benefits claimed. One simply cannot take elements from one design and use them in another design and expect the mixed-and-matched combination to work under all scenarios. Third, the fact that arc lamps are commonly available is not a reason to wholesale incorporate such a device with the Chuang objective – this is an end result gleaned from Appellant's claims, put forward to support a combination that has no suggestion or support in the references themselves.

The Examiner's Answer effectively argues that the rejection is not simply taking an arc lamp and plugging the arc lamp into the Chuang design, but employing the teachings of an arc lamp with the teachings of the Chuang objective. Appellants respond by stating wholesale use of arc lamp type light energy with an objective having the features of Chuang is attempting to use an arc lamp having a specific light energy emission profile with an objective not specifically calling for the specific light energy emission profile. In other words, just because arc lamp light energy may be employed does not mean it could be successfully employed with the design provided to produce an objective having the features claimed. Thus Appellants continue to dispute that one

would be motivated to employ the arc lamp teachings of Shafer with the Chuang design, as such a combination would require extensive effort to fashion a workable and useful design having the features claimed.

Regarding combining the arc lamp teachings of Shafer with the Chuang objective, it is disingenuous and overly simplistic to say that the ability "to examine different specimen characteristics under different light conditions" is desirable – better performance is always desirable. The question is what *reasoning* supports combining the references to produce the invention claimed, and "ability to examine under different conditions" is not reasoning supporting such a combination. This reasoning is tantamount to saying one would be motivated to combine A with B because then you could have A and B. This is not a reason to combine, but a desired end result gleaned from Applicant's claims and the use of hindsight.

The alchemy attempted in the Examiner's Answer requires fundamental changes to both Chuang and Shafer that are not taught or disclosed in either reference and would fundamentally change the teachings of each reference. Force of will alone is insufficient to meld Chuang and Shafer. An arc lamp can be placed in front of anything, but the question is what would motivate one to do so based on the designs presented – here, no motivation having reasonable factual underpinnings has been presented.

The references have been combined using hindsight, which is improper. The Examiner's Answer uses hindsight reasoning in fashioning the combination of Chuang and Shafer, in an effort to deprecate the present claims, and the Examiner's Answer presents no reasons having rational underpinnings in support of the combination. The reasoning presented, again, is tantamount to saying one would be motivated to combine A with B because then you could have A and B, which is better than just A. This is not a reason to combine, but a desired end result gleaned from Appellants' claims and the use of hindsight.

Liang + Shafer '722

The Examiner's Answer picks and chooses aspects from Liang and Shafer '722, but Appellants note that (1) Liang does not include an illumination subsystem comprising an arc lamp having the specified energy profile (wavelength characteristics), and (2) Liang lacks the Mangin mirror arrangement or collection of optics for collecting light energy called for in the independent claims. The Examiner's Answer locates these significant missing elements in Shafer '722, which shows an off-axis arrangement contrary to the claim language (e.g. claim 75, "comprising a plurality of optical elements all aligned along an axis"; claim 1, "said imaging subsystem comprising a plurality of elements all aligned along a single axis"). Again, Appellants note that a fundamental argument being made in the present case is that one can simply employ certain elements with previously available but materially different objective designs and obtain a functional design having the performance parameters claimed. In reality, certain design elements cannot be wholesale incorporated into existing designs and produce a workable completed design, such as an off-axis objective being fundamentally changed to an on-axis objective that produces improved performance characteristics. In reality, the off-axis Shafer '722 design could not be combined with the teachings of Liang to produce a workable design, much less one that conforms to the limitations of the present claims.

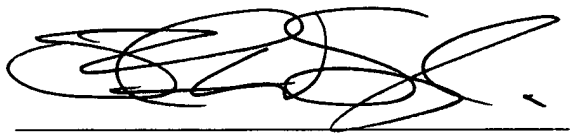
Accordingly, it is respectfully submitted that all pending claims fully comply with 35 U.S.C. § 103.

CONCLUSION

In view of the foregoing, Appellants submit that all pending claims are patentably distinct over the prior art and are allowable. Thus the Final Office Action rejecting all pending claims is in error and should be reversed.

Appellants believe that no fees are due in accordance with this Reply Brief beyond those included herewith. Should any additional fees be due or overpayment made, the Commissioner is hereby authorized to charge any deficiencies or credit any overpayment to Deposit Account 502026.

Respectfully submitted,



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